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THE MORPHOPHONEMICS OF POLISH

by

Charles E. Bidwell

Electronic Teaching Laboratories

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0.1 This study will attempt to describe the morphophonemics of standard Polish. While all my informants are from southern Poland, I believe that this analysis is valid for the educated speech of all regions.[1] The analysis is based primarily on work with informants in preparation of a Polish course for the Foreign Service Institute, but I have also extensively utilized studies made by previous workers in the field.[2] Though this study is a descriptive one, I have added a few historical comments in the form of footnotes, where I felt they were pertinent.

0.2 The following phonemic analysis of Polish is assumed:

vowels:

i y u
e o
a

consonants:

		labial	dental	palatal	retracted	velar
stops	voiceless	p	t			k
	voiced	b	d			g
	nasal	m	n	ń		
fricatives	voiceless	f	s	ś	š	x
	voiced	v	z	ź	ž	
affricates	voiceless		c	ć	č	
	voiced		ʒ	ʒ́	ǯ	

Apical trill: r
lateral: l

semivowels: nasal: w̃ j̃; non-nasal: w j

Three stresses are assumed: weak (no symbol), secondary /ˌ/ and primary /ˈ/. Every word has lexical stress, which is fixed on one syllable, usually the penult.[3] Lexical stress may be realized in the utterance as primary or secondary. All syllables without primary or secondary stress have weak stress. Five kinds of transition are assumed: close (that which occurs between phonemes when no other type of transition is present - no symbol has been assigned to it), open /+/, level /|/, prepausal rising /↑/, and prepausal falling /↓/. Four pitch levels probably occur and are symbolized by superscript numerals. Stress, pitch, and transitional phenomena are irrelevant in most of the examples cited in this study and have usually therefore not been marked. Where it contributes to the clarification of the example, I have indicated morpheme boundary with a hyphen.

A few remarks should be made concerning some of the individual phonemes. /p b f v m/ have palatalized allophones before /i/ and /j/ (more or less palatalized depending on the speaker). /k g x/ have palatalized allophones before /i/ and /j/, and /k/ and /g/ also have palatalized allophones before /e/ in the speech of those who do not have the sequence /kje/ in their idiolect. /x/, normally voiceless, has a voiced allophone before voiced consonants. /w̃/ and /j̃/ occur only in postvocalic position. /w̃/ represents nasalization of the preceding vowel, plus, in deliberate speech, a high back semivocalic off-glide. This off-glide does not occur in rapid speech. /j̃/ represents nasalization of the preceding vowel plus a high front nasalized off-glide. This off-glide is always present in all styles of standard speech.

0.3 Morphophonemic change is understood for the purposes of this study to be any phonemic replacement, addition or subtraction which takes place in a set of morphemes when they are shifted from one phonologically or morphologically comparable environment to another. In this study I shall not ordinarily treat alternations occurring in classes containing only one member.

0.4 I shall first treat those morphophonemic changes which are determined by the phonological structure of the language and which affect every morpheme which occurs under the conditions stated for the change. I term such changes general

morphophonemic changes.[4] I shall list as a sub-group within this class morphophonemic changes resulting from differences in style. I shall then treat those morphophonemic changes which affect only limited groups of morphemes, for example, morphemes, in certain form-classes or morphemes which must be listed. I term these latter changes special morphophonemic changes.

0.5 Two or more morphophonemic changes may occur in the same morpheme. Thus in the word robota /robota/ 'work' we have the changes /o~u/ (genitive plural robót /robut/) and substitutive softening (locative singular robocie /robo$\acute{c}$e/). These changes affect different constituent phonemes of the morpheme and occur independently of each other.

0,6 Some morphophonemic changes never occur except in the presence of some other specific morphophonemic change. In such a case the two changes do not occur independently, but change a (which never occurs except in presence of change b) is conditioned by the occurrence of change b. Thus change /e~a/ (see 2.2.1.2.2 below) is conditioned by the occurrence of substitutive softening in the following consonant. Change b however (in the example, substitutive softening) may occur without change a. (If a and b never occurred in each other's absence, they would constitute not two, but one morphophonemic change.)

0.7 Two morphophonemic changes may occur independently of each other in some morphemes, but exhibit parallel occurrence in another set of morphemes. Thus, both /e~Ø/ and substitutive softening occur independently in a large number of morphemes, but there is also a large set of morphemes where the consonant preceding /e~Ø/ undergoes substitutive softening, showing stage II when e is present and stage I before zero. What I have termed /e~Ø/^{2} (see 2.2.1.5.2 below) for ease of description are really parallel occurrences of /e~Ø/ and substitutive softening. Likewise, /o~Ø/^{1} represents parallel occurrence of /o~Ø/ and substitutive softening (see 2.2.1.5.3 below).

0.8 Frequently two or more morphophonemic changes may affect the same constituent phoneme of a given morpheme. Thus, in the word chleb /xlep/ 'bread' voiced-voiceless alternation (see 1.1.1.2) and substitutive softening both affect the base-final consonant. When two morphophonemic changes affect the same

phoneme, we may say that they occur in combination. Combinations of a general and a special change as in the example above are quite common, and combinations of two or more special changes are not infrequent.

0.9 In Polish, simple morphophonemic changes (those which do not represent combinations of more than one change) usually consist of only two alternants. Substitutive softening changes are an exception (see 2.1.1 below). Here we may see three replacements constituting a single morphophonemic change. Thus, jazda /jazda/ 'ride, journey'; jeżdżę /ježdžeṽ/ 'I'm riding'; jeździe /jeźźe/ 'he's riding'.

In a combination of morphophonemic changes the principal alternation is that whose alternants in turn undergo subordinate alternations. Thus, if we have simple alternations a b and a~c, a combination of the two with a~b as principal alternation and a~c as subordinate will result in (a~c)~b (example: /(o~u)~a/, 2.2.5.7 below). Sometimes the subordinate alternations may have further alternations subordinate to them. Thus /(e~(o~u))~a/ where the principal alternation is /e~a/, the subordinate /e~o/[2], and subordinate to the latter /o~u/ (see 2.2.5.6 below). Occasionally, we may have a combination of changes where the principal alternation does not occur independently. Thus, we have /(n~ń)~ṽ/ (2.1.2.1.1 below) though we never have /ń~ṽ/ or /n~ṽ/ as independent alternations.

In listing morphophonemic changes I have not noted combinations of general and special changes. It should be understood that whenever the conditions of their occurrence arise, the general changes will affect the alternants of any given special change.

1.0 General morphophonemic changes.

1.1.1 For morphophonemic purposes Polish consonants may be classed as voiced, voiceless, and neutral. Neutral are /m n ń r l w j ṽ j̃/. With the exception of /x/, which has no counterpart, voiced and voiceless phonemes occur in pairs. The pairs are articulated in the same position, the voiced and voiceless counterparts being distinguished by the presence or absence of voicing.

Voiced are: b d g v z ź ž ʒ ʒ́ ǯ

Voiceless are: p t k f s ś š c ć č x

1.1.1.1. Neutral consonants may enter into clusters with consonants of any category - neutral, voiced, or voiceless. Voiced and voiceless consonants occur in clusters with consonants of their own category, or with neutral consonants. When morphological processes juxtapose voiced and voiceless consonants, the last voiced or voiceless consonant of the cluster remains unchanged, but preceding consonants of the cluster, except /x/, are replaced by their counterparts, so as to agree in regard to voicing with the last voiced or unvoiced consonant of the cluster.

mówić /muvić/ 'to speak' mówcie /mufće/ 'speak!'

Warszawa /varšava/ 'Warsaw' warszawski /varšafski/ 'Warsovian'

tak /tak/ 'so' także /tagže/ 'also'

1.1.1.2 Vowels and neutral consonants appear freely in word-final position. In word-final position before pausal juncture /|↑↓/ voiceless, but not voiced, consonants may appear. When the word is immediately followed, without pausal juncture, by a word beginning with a voiced consonant, voiced, but not voiceless, consonants may appear. Followed immediately by a word beginning with a voiceless consonant, voiceless, but not voiced, consonants may appear in word-final position. Followed immediately by a word beginning with a vowel or a neutral consonant, some varieties of the standard language permit voiceless, but not voiced consonants. Other varieties contrariwise permit voiced, but not voiceless, consonants. When morphological processes cause a morpheme otherwise ending in a voiced or voiceless consonant to appear in word-final position, the word-final consonant, unless it is /x/, will be replaced by its counterpart whenever required by its position before pause, vowel, or neutral consonant, or before voiced or voiceless consonant. If the word-final consonant is /x/ (which functions as a voiceless consonant, but has no voiced counterpart), a voiced allophone will appear in those positions where a voiced counterpart would be required.

talerz /taleš/ 'plate' talerza /taleža/ 'of a plate'

Wacław /vacwaf/ 'Wenceslas' Wacława /vacwava/ 'of Wenceslas'

Kazimierz pisze /kažimješčiše/ 'Casimir is writing'

Kazimierza /kažimježa/ 'of Casimir'

Staś dojedzie /staźdoježe/ 'Stan'll drive here'
Stasia /staśa/ 'of Stan'
kot bawi sie /kodbaviše/ 'the cat's playing' kota /kota/ 'of the cat'
Kazik otpowiedzial /kaźigotpovježa w/ or /kazikotpovježa w/ 'Caz answered' Kazika /kaźika/ 'of Caz'
Kazik nie mówi /kaźigńemluvi/ or /kaźikńemluvi/ 'Caz isn't talking'

1.1.2 Clusters consisting of dental fricatives with palatal or retracted fricatives do not occur. When grammatical processes bring elements together in such a way that such a cluster would otherwise occur, a preceding dental fricative is assimilated to a following palatal or retracted fricative.

z ojcem /zojcem/ 'with father' z mamusia /zmamušõ/ 'with mother'
z toba /stobõ/ 'with you' z siostra /śśostrõ/ 'with sister'
z ziemia /źźemjõ/ 'with the earth' z ciotka /śćotkõ/ 'with auntie'
z dziewczyna /źźefčynõ/ 'with a girl' z szabla /ššablõ/, 'with a saber'
z żona /žžonõ/ 'with my wife' z Czesławem /šćeswavem/ 'with Czeslaw'
z dżdżownica /žžovńicõ/ 'with an earthworm'
ssę /sseõ/ 'I'm sucking' ssiesz /śśeš/ 'you're sucking'
trzesł sie /čšewšše/ or /čšewšše/ 'he trembled'
niesła /ńeswa/ 'she carried' nieść /ńešć/ 'to carry'
zetnę /zetneõ/ 'I'll cut' ściąć /śćońć/ 'to cut'
zaniosł /zanus/ 'he took there' zaniósłszy /zanušśy/ 'having taken there'

1.2.3 /n/ never appears before a palatal consonant. If grammatical processes would otherwise cause an /n/ to appear before such a consonant, the /n/ is replaced by /ń/.

panna /panna/ 'young lady' o pannie /opańńe/ 'about a young lady'
lont /lont/ 'fuse' o loncie /olońće/ 'about a fuse'
lad /lont/ 'land' o ladzie /olońźe/ 'about land'
zwierzęta /zvježenta/ 'animals' zwierzęcia /zvježeńća/ 'of an animal'
zgięty /zgjenty/ 'bent' zgięcie /zgjeńće/ 'bending'

1.1.4. Except as a result of prefixation, clusters consisting of the dental fricatives /s/ and /z/, plus /l/, /ń/, or /mj/ do not

occur within the domain of the word, unless the fricative is preceded by /r/ or /w/[5]. Therefore, if as a result of any morphological process except prefixation such a cluster would otherwise occur within the boundary of a word, the /s/ or /z/ is replaced by its palatal counterpart /ś/ or /ź/. Thus:

masło /maswo/ 'butter' o maśle /omaśle/ 'about butter'
wiosna /vjosna/ 'spring' o wiośnie /ovjośńe/ 'about spring'
pasmo /pasmo/ 'belt, strip' o paśmie /opaśmje/ 'about a strip'
węzła /veŵzwa/ 'knot' o węźle /oveŵźle/ 'about a knot'
mężczyzna /meŵščyzna/ 'man, male person'
o mężczyźnie /omeŵščyźńe/ 'about a man'
komunizm /komunizm/ 'communism' o komuniźmie /okomuńiźmje/ 'about communism'
niosła /ńoswa/ 'she carried' nieśli /ńeśli/ 'they carried'
wiozła /vjazwa/ 'she transported' wiezli /vjeźli/ they transported'
ćisnąć /ćisnońć/ 'to press' ciśnięcie /ćiśńeńće/ 'pressure'

but:

nieść /ńeść/ 'to carry' rozniesc /rozńeść/ 'to distribute by carrying'
marznę /marzneŵ/ 'I'm freezing' marznie /marzńe/ 'he's freezing'
pełzła /pewzwa/ 'she crawled' pełzli /pewzli/ 'they crawled'

1.1.5 Word-final clusters of the type /Cj/ or /CC...Cj/ do not occur. If as a result of morphological processes such a cluster would otherwise occur in word-final position, as, for example, if a morpheme otherwise ending in Cj were to appear in word-final position, the /j/ is dropped. Though the foregoing statement is formulated to apply to clusters of any consonant plus /j/, in practice it applies only to clusters of labial consonants plus /j/, as no morpheme ending in a cluster of a non-labial consonant plus /j/ alternates between word-internal and word-final position.

ziemia /źemja/ 'earth, land' ziem /źem/ 'of lands'
gołębia /gowembja/ 'of a pigeon' gołąb /gowomp/ 'pigeon'
brwią /brvjoŵ/ 'with an eyebrow' brew /bref/ 'eyebrow'
złapiesz /zwapješ/ 'you'll catch' złap /zwap/ 'catch'

1.1.6.1. The combination of labial consonant (represented by B) plus /j/ plus /i/ does not occur. If morphological processes

would otherwise cause /bj/ to appear before /i/, the /j/ falls.

premja /premja/ 'premium' o premii /opremi/ 'about a premium'

ziemia /źemja/ 'earth, land' o ziemi /oźemi/ 'about land'

gołębia /gowembja/ 'of a pigeon' gołębi /gowembi/ 'pigeons'

brwią /brvjǫ̃/, 'with an eyebrow' brwi / brvi/ 'of an eyebrow'

1.1.6.2 The sequence C jC does not occur. If morphological processes would otherwise cause such a sequence to appear, the /j/ falls.

złapiesz /zwapješ/ 'you'll catch' złapmy /zwapmy/ 'let's catch'

ziemia /źemja/ 'land, earth' ziemski /źemski/ and ziemny /źemny/ 'pertaining to earth or land'

1.1.7.1 Word-final Cw does not occur except before an enclitic. When morphological processes would otherwise cause the occurrence of such a cluster, /w/ falls.

spadło /spadwo/ 'it fell' spadł /spat/ 'he fell'

1.1.7.2 The sequence CwC does not occur. When morphological processes would otherwise cause the occurrence of such a sequence, /w/ falls.

jabłek /jabwek/ 'of apples' jabłka /japka/ 'apple'

1.1.8 When morphological processes would otherwise cause /t/ to be followed by /c/, the /t/ falls. Thus ojciec /ojćec/ 'father' (stem /ojtc-/ with substitutive softening of /t/ before movable /e/, see 2.2.1.5.2 below), genitive ojca /ojca/.

1.1.9.1 The cluster /čś/ does not occur in word-final position or before another consonant. When morphological processes would otherwise cause /čś/ to appear in word-final position or before a consonant, the /ś/ falls.

popatrzyć /popačśyć/ 'to look' popatrz /popač/ 'look'

popatrzmy /popačmy/ 'let's look'

1.1.9.2 The sequence /VtšV/ does not occur. When morphological processes would otherwise cause such a sequence to appear, /t/ is replaced by /č/.

wiatr /vjatr/ 'wind' o wietrze /ovječše/ 'about wind'

1.1.10 /i/ never occurs after the retracted consonants /š ž č ǯ/ or the dental affricates /c/ and /ʒ/. When morphological processes would otherwise cause an /i/ to appear af-

ter such a consonant, the /i/ is replaced by /y/.

bronić /bronić/ 'to defend', kupić /kupić/ 'to buy', but uczyć /učyć/ 'to teach'

wsi /vśi/ 'of a village' brwi /brvi/ 'of an eyebrow' but rzeczy /žečy/ 'of a thing' nocy /nocy/ 'of night'

Francuzi /francuźi/ 'Frenchmen' chłopi /xwopi/ 'peasants' but Norwedzy /norveʒy/ 'Norwegians' Polacy /polacy/ 'Poles'

1.1.11 /y/ never occurs after the palatal consonants /ś ź ć ʒ ń /, the semivowel /j/, and two of the velars /k/ and /g/. When morphological processes would otherwise cause /y/ to appear after such a consonant, it is replaced by /i/. Thus, in the adjective paradigm we have from the base /star-/ 'old' stary /stary/, starym /starym/, starych /staryx/, starymi /starymi/, but from /tań-/ 'cheap' and /polsk-/ 'Polish' we have tani /tańi/, tanim /tańim/, tanich /tańix/, and polski /polski/, polskim /polskim/, polskich /polskix/, polskimi /polskimi/. In the noun paradigms we have psy /psy/ 'dogs' but ptaki /ptaki/ 'birds' and głowy /gwovy/ 'of a head', królewny /krulevny/ 'of a queen', macochy /macoxy/ 'of a stepmother', but ręki /renki/ 'of a hand', nogi /nogi/ 'of a foot', kawiarni /kavjarńi/ 'of a cafe', szyi /šyji/ 'of a neck'. We also have rozbudowywać /rozbudovyvać/ 'to be building up', pokazywać /pokazyvać/ 'to show', but polegiwać /polegivać/, 'to be lying around'.

1.1.12 Many varieties of Polish make no distinction between the initial syllables of pairs like kelner 'waiter' and kielnia 'towel' or germanski 'Germanic' and giermek 'squire'. Standard Polish has respectiveiy /kelner/, /kjelńa/, /germański/, /gjermek/. In varieties of Polish which do not make a distinction in the above pairs, the clusters /kj/ and /gj/ do not occur, since /k,j/ always have palatalized allophones before /e/. Since standard Polish does make a distinction, it is necessary to analyze the latter members of the above pairs as beginning with /kj/ and /gj/. In standard Polish, words containing /k/ and /g/ followed by /e/ are rather rare, all being fairly recent borrowings. Whenever within the boundary of a word morphological processes would otherwise cause a /k/ or /g/ to be followed by /e/, a /j/ is intercalated, e.g. /kje/, /gje/. Let us examine some examples from the adjective paradigm on the bases /star-/ 'old', /polsk-/ 'Polish' and /ubog-/ 'poor': stare

/stare/, starego, /starego/, staremu /staremu/, starej /starej/, but polskie /polskje/, polskiego /polskjego/, polskiemu /polskjemu/, polskiej /polskjej/, and ubogie /ubogje/, ubogiego /ubogjego/, ubogiemu /ubogjemu/, and ubogiej /ubogjej/. A further example, the instrumental singular from one of the noun paradigms on the bases /xwop-/ 'peasant'. /polak-/ 'Pole', and /norweg-/ 'Norwegian': chłopem /xwopem/, Polakiem /polakjem/, Norwegiem /norwegjem/.

1.1.13 Whenever an inflexional morpheme (suffix, formant or ending) otherwise beginning with a vowel follows a morpheme ending in a vowel with no intervening phoneme (zero allomorphs may intervene), the inflexional morpheme will be realized in an allomorph with an added initial /j/. Compare nieść /ńeś-∅-ć/ 'to carry', niesiesz /ńeś-e-š/ 'you carry' with myć /my-∅-ć/ 'to wash' myjesz /my-je-š/ 'you wash', pić /pi-∅-č/ 'to drink', pijesz /pi-je-š/ 'you drink, czuć /ču-∅-ć/, 'to feel' czujesz /ču-je-š/ 'you feel'.

1.1.14 /w̃/ never appears before stops or affricates. When a morphological process would otherwise cause /w̃/ to appear before a stop or affricate, /w̃/ is replaced by /m/ before nasal stops, /ń/ before palatal affricates, and /n/ before dental, retracted, and velar stops and affricates.

zgiąwszy /zgjow̃fšy/ 'having bent' zgięty /zgjenty/ 'bent' zgiąć /zgjońć/ 'to bend'

1.2.0 General morphophonemic changes conditioned by style.

1.2.1 In non-deliberate speech of ordinary conversational speed, /n/ and /ń/ followed by a fricative tend to be replaced by /w̃/ and /j̃/ respectively. It is extremely difficult to state general rules on this point, as individual lexical items present considerable variation. In general, replacement is the more likely to take place the more familiar (statistically frequent in occurrence) the lexical item involved is. Thus, in words of great frequency of occurrence, the replacement will take place even in quite deliberate speech, while in less frequently occurring words, particularly learned words borrowed from other languages, replacement may be avoided even in normal conversation. One may also say that there is a slightly greater tendency for /ń/ to be replaced than /n/, and that /n/ is less readily replaced before labial fricatives than before others. Thus we have:

konszachty 'intrigues, conspiracy' usually /kow̃šaxty/,

/konšaxty/ possible.

inżynjer 'engineer' /iw̃žyńer/ or /inžyńer/

inspiracia 'inspiration' /iw̃spiracja/ or /inspiracja/

inszość 'difference' /iw̃šość́/ or /inšość́/

infant 'infant' /infant/ more usual, but /iw̃fant/ quite possible

tynf (name of an obsolete coin) /tynf/ usual, but /tyw̃f/ possible

czynsz 'rent' /čyw̃š/ almost always, /čynš/ barely possible

tanszy 'cheaper' /taj̃šy/ almost always, rarely /tańšy/

słonszy 'saltier' /swow̃šy/ almost always, rarely /swonšy/

Kamiński (a family name) almost always /kamij̃ski/, /kamiński/ possible only in the most deliberate speech.

1.2.2 In normal colloquial speech /w̃/ does not appear before /l/ and /w/. Thus, when morphological processes cause /w̃/ to appear before /l/ and /w/, the /w̃/ is normally lost. It can however be preserved in deliberate speech. Thus:

gięła 'she was bending' /gjewa/, /gjew̃wa/

gięli 'they were bending' /gjeli/, /gjew̃li/

The above statement is formulated to cover the total Polish structure, but it comes into effect only in the l-forms of e type verbs with bases or stem-suffixes ending in nasals.[6]

1.2.3 In word-final position /w̃/ following /e/ drops in normal colloquial speech.

mogę 'I can' /moge/ normal, /mogew̃/ deliberate

kobietę 'woman (accusative)' /kobjete/, /kobjetew̃/

1.2.4 In rapid speech unstressed /e/ between consonants (particularly in a syllable immediately following a stressed syllable) tends to be replaced by /y/ (excepting after consonants which /y/ does not follow, where it is replaced by /i/). Thus:

wolniej 'more slowly' /volńej/ or /volńij/

też 'also' /teš/ or /tyš/

przypatrzeć się 'to look at' /pšypačšeć+śew̃/ or /pšypačšyčše/

2.0 Special morphophonemic changes.

2.1 Consonant changes.

2.1.1 Substitutive softening.

Between the allomorphs of many single morphemes we note consonantal alternations. Thus we have:

w~l

szkoła /škow-a/ 'school' o szkole /o-škol-e/ 'about school'

n~ń

żona /žon-a/ 'wife' o żonie /o-žoń-e/ 'about my wife'

r~(ž~š)

kara /kar-a/ 'fine' o karze /o-kaž-e/ 'about a fine'

siostra /śostr-a/ 'sister' o siestrze /o-śestš-e/ 'about sister'

We see that /r/ alternates with both /ž/ and /š/, /š/ occurring only when the preceding segmental phoneme is a voiceless consonant, /ž/ occurring otherwise.

In a similar frame we have labial consonants alternating with labial plus /j/:

baba /bab-a/ 'old woman' o babie /o-babj-e/ 'about an old woman'

mapa /map-a/ 'map' o mapie /o-mapj-e/ 'about a map'

trawa /trav-a/ 'grass' o trawie /o-travj-e/ 'about grass'

szafa /šaf-a/ 'cupboard' o szafie /o-šafj-e/

firma /firm-a/ 'firm' o firmie /o-firmj-e/

Now let us examine some other consonants in like frames:

kosa /kos-a/ 'scythe' o kosie /o-koś-e/

skaza /skaz-a/ 'defect, blemish' o skazie /o-skaź-e/

zapłata /za-pwat-a/ 'payment' o zapłacie /o-za-pwać-e/

jazda /jazd-a/ 'trip' o jeździe /o-jeźʒ-e/

In the same morpheme we note a further change:

kosi /koś-i-∅/ 'he mows' koszę /koš-e-w̃/ 'I mow'

skazi /skaź-i-∅/ 'he'll blemish' skażę /skaž-e-w̃/ 'I'll blemish'

płaci /pwać-i-∅/ 'he's paying' płacę /pwac-e-w̃/ 'I'm paying'

jezdzi /jeźʒ-i-∅/ 'he rides' jeżdżę /ježʒ-e-w̃/ 'I ride'

Let us examine the velar consonants in the same fashion:

reka /renk-a/ 'hand' o ręce /o-renc-e/ 'about a hand' rączka /ronč-k-a/ 'little hand'

noga /nog-a/ 'foot' o nodze /o-noʒ-e/ 'about a foot' nóżek /nuž-ek-∅/ 'of little feet'

mucha /mux-a/ 'fly' o musze /o-muš-e/ 'about a fly'
cichy /ćixy/ 'quiet' cisi /ćiśi/ 'quiet (plural)'

While /w n r/ and the labials show only one alternation in these frames, /t d s z k g x/ each show two replacements. For the purpose of classifying these alternations /w n r p b f v m t d s z k g x/ will be termed stage I. /l ń (ž š)/ will be termed stage II with relation to /w n r/ as will each labial plus /j/ in relation to the corresponding labial without /j/. /ć ʒ ś ź č ž š/ will be termed stage IIa and /c ʒ š ž c ʒ ś/ stage IIb in relation to /t d s z k g x/. Every Polish consonant except /j/ and the nasal semivowels appears either as stage I or stage II (a or b). No phoneme appears both in stage I and II, though some phonemes appear as stage II counterparts to two or more stage I consonants. /ž/ is IIa to both /r/ and /g/ and IIb to /z/, for example /c/ is IIb to /t/ and /k/, etc. On the basis of the foregoing, the following table may be constructed:

	labial					liquid			front				velar			
	p	b	f	v	m	w	r	n	s	z	t	d	k	g	x	Stage I
j	pj	bj	fj	vj	mj	l	ž (š)	ń	ś	ź	ć	ʒ	č	ž	š	a Stage
									š	ž	c	ʒ	c	ʒ	ś	b II

In alternations of the above type, which I will term substitutive softening, each consonant alternates only with the consonant immediately above or below it on the table.[7] The utility of this classification lies in the fact that it provides an easy means of describing the various occurrences of substitutive softening which are extremely common in Polish morphology. The utility is increased by grouping certain consonants on stage I and assigning to them together with their stage II counterparts arbitrary designations (which I have based on the articulatory position of the stage I consonants). In general, consonants of these four groups show the same alternations, that is, if in a given morphological change one front consonant changes from stage I to IIb, the other front consonants will also change to IIb, whereas velars might well show a change to IIa.

A few examples will now be given showing the application of this classification to various morphological changes.

We observe the change which takes place in the base-final consonant between the locative singular and the remaining cases of nouns, using examples already given. The examples will be given in phonemic transcription, the nominative form first, then the locatives:

mapa - mapje, baba - babje, šafa - šafje, trava - travje, firma - firmje, škowa - škole, kara - kaže, žona - žońe, kosa - koše, skaza - skaźe, zapwata - zapwaće, jazda - jeźźe, renka - rence, noga - noze, muxa - muše

On the basis of the above classification of substitutive softening, we may formulate the statement: Nouns having stage I consonants in base-final position before other case endings show, before the locative singular ending /e/, stage II consonants if the base-final consonant is labial or liquid, stage IIa if the base-final consonant is front or is /x/, and stage IIb if it is /k/ or /g/.

Let us consider another change, which occurs in the base-final consonant in the masculine personal nominative plural of adjectives. Below we give the masculine nominatives singular and the masculine personal nominative plural forms of a number of adjectives.

słaby /swaby/ słabi /swabi/ 'weak', tępy /tempy/ tępi /tempi/ 'dull', kulawy /kulavy/ kulawi /kulavi/ 'lame', znajomy /znajomy/ znajomi /znajomi/ 'acquaintance', stary /stary/ starzy /stažy/ 'old', biały /bjawy/ biali /bjali/ 'white', pełny /pewny/ pełni /pewńi/ 'full', bogaty /bogaty/ bogaci /bogaci/, 'rich', chudy /xudy/ chudzi /xuzi/ 'thin' bosy /bosy/ bosi /boši/ 'barefoot', wielky /vjelky/ wielcy /vjelcy/ 'great', ubogi /ubogi/ ubodzy /uboży/ 'poor', cichy /ćixy/ cisi /ćiši/ 'quiet', pierwszy /pjerfšy/ pierwsi /pjerfši/ 'first'. We may formulate the statement: Adjectives having stage I base-final consonants before other case endings show, before the masculine personal nominative plural ending /i/ or /y/, stage I (no change) if the base-final consonant is labial, stage II if the base final consonant is liquid, stage IIa if it is front, and stage IIb if it is velar. In addition, base final /š/ (stage IIb) changes to /ś/ (stage IIa).

Almost all special consonant changes in Polish are a variety of substitutive softening and are easily described in terms of the above frame of reference. Stage I consonants have traditionally been termed 'hard' in contrast to stage II consonants and /j/, which have traditionally been called 'soft'. This is a useful dichotomy, since only nouns with 'hard' stems (stems occurring with base-final stage I consonant in at least some cases other than nominative and accusative singular) show substitutive softening, and nouns with soft stems in some cases have different endings from those with hard stems.
Thus:

chata /xata/ 'hut' o chacie /oxaće/ 'about a hut'
kawiarnia /kavjarńa/ 'cafe' o kawiarni /okavjarńi/ 'about a cafe'
wóz /vus/ 'wagon' o wozie /ovoźe/ 'about a wagon'
lokaj /lokaj/ 'lackey' o lokaju /olokaju/ 'about a lackey'
profesor /profesor/ 'professor' profesorzy /profesoży/ 'professors'
tragarz /tragaš/ 'porter' tragarze /tragaže/ 'porters'

2.1.1.1 Effect of substitutive softening on clusters.

Only the final consonant of a cluster undergoes substitutive softening. A consonant is affected by the substitutive softening of a consonant following it only insofar as the general morphophonemic principles of the language come into play. Thus:

izba /izba/ 'room, chamber' o izbie /o+izbje/ 'about the room'
bursa /bursa/ 'exchange' o bursie /oburśe/ 'about the exchange'
nafta /nafta/ 'petroleum' o nafcie /onafće/ 'about petroleum'
iskra /iskra/ 'spark' o iskrze /o+iskže/ 'about a spark'
Polska /polska/ 'Poland' o Polsce /opolsce/ 'about Poland'
ranga /ranga/ 'rank' o randze /oranze/ 'about rank'
panna /panna/ 'young lady' o pannie /opańńe/ 'about a young lady'
wiosna /vjosna/ 'spring' o wiosnie /ovjośńe/ 'about spring'
pasmo /pasmo/ 'band, strip' o paśmie /opaśmje/ 'about a band'

2.1.2. Special consonant changes not resulting from substitutive softening.

2.1.2.1. Alternations involving nasal consonants.

2.1.2.1.1 /(n~ń)~w̃/. The alternation appears in verbs of the e class with base-final nasals. Base-final /n/ or its stage II counterpart /ń/ appears in the present-stem forms, /w̃/ or its replacements (see 1.1.14 above) in the infinitive-stem forms. It also occurs in nouns like imię /imjew̃/ 'name', where /w̃/ occurs in the nominative and accusative singular, /ń/ in the remaining cases of the singular, and /n/ in the plural. Thus: zgnę /z-gn-e-w̃/ 'I'll bend', zgniesz /z-gń-e-š/ 'you'll bend' versus zgiąwszy /z-gjow̃-∅-fšy/ 'having bent', zgiąć /z-gjoń-∅-ć/ 'to bend', zgiął /z-gjo-∅-w-∅/ 'he bent', zgięty /z-gjen-∅-t-y/ 'bent'. Also: imię /imjew̃-∅/ 'name', imienia /imjeń-a/ 'of a name', imiona /imjon-a/ 'names'.

2.1.2.1.2 /(m~mj)~w̃/. This alternation also appears in verbs of the e class with base-final nasals. Base-final /m/ or its stage II counterpart /mj/ appears in the present-stem forms, /w̃/ or its replacements in the infinitive-stem forms. Thus: zajmę /za-jm-e-w̃/ 'I'll occupy', zajmie /za-jmj-e-∅ 'he'll occupy' versus zająć /za-joń-∅-ć/ 'to occupy', zająwszy /za-jow̃-∅-fšy/ 'having occupied', zajęła /za-je-∅-w-a/ 'she occupied', zajęty /za-jen-∅-t-y/ 'occupied'.

2.1.2.2 Alternations of consonant and zero.

2.1.2.2.1 /(t~ć)~∅. This alternation of /t/ and its stage IIa counterpart /ć/ with zero occurs in conjunction with and is conditioned by the alternation /(n~ń)~w̃/. /t/ occurs after /n/, /ć/ after /ń/ and zero after /w̃/. Thus: zwierzę /zvježew̃-∅/ 'animal', zwierzęcia /zvježeńć-a/ 'of an animal', zwierzęta /zvježent-a/ 'animals'.

2.1.2.2.2 /d~∅/. This is an alternation of /d/ (or its stage II counterparts /ʒ́/ and /ʒ/) on the one hand and zero on the other. It occurs only in the bases of the verbs dać /dać/ 'to give', jeść /jeść/ 'to eat', and wiedzieć /vjeʒ́eć/ 'to know' and always occurs in conjunction with alternation of the preceding vowel with zero.

dadzą /daʒ-o-w̃/ 'they'll give'	dać /d-a-ć/ 'to give'
dam /d-a-m/ 'I'll give'	
wiedzieć /vjeʒ́-e-ć/ 'to know'	wiem /vj-e-m/ 'I know'
wiedzą /vjeʒ-o-w̃/ 'they know'	wie /vj-e-∅/ 'he knows'
jadła /jad-∅-w-a/ 'she ate'	jem /j-e-m/ 'I'm eating'

jedzą /jeʒ-o-w̃/ 'they're eating' je /j-e-∅/ 'he's eating'
jedzony /jeʒ-o-n-y/ 'eaten'

It will be seen from the above examples that the third person plural present tense and all non-present-tense forms show /d/ (or its stage II alternants) preceded by a vowel. In present tense forms other than the third person plural both /d/ and the preceding vowel are replaced by zero in the verb base.

2.1.2.2.3 /ś~∅/. This alternation occurs only in the first and second person plural verbal ending morphemes.

jemy /j-e-my/ 'we're eating' jedliśmy /jed-∅-l-i-śmy/ 'we ate'

jecie /j-e-ć̑e/ 'you're eating' jedliście /jed-∅-l-i-śc̑e/ 'you ate'

2.1.2.2.4 /k~∅/ and /g~∅/. These alternations appear in verbs of the e class with base-final /k/ or /g/. In the infinitive /k/ and /g/ are replaced by zero. In these verbs the infinitive formant also shows the allomorph /c/ (stage IIb) rather than /ć/ (stage IIa) which occurs otherwise.

piekła /pjek-∅-w-a/ 'she baked' piec /pje-∅-c/ 'to bake'

mogła /mog-∅-w-a/ 'she was able' móc /mu-∅-c/ 'to be able'

2.1.2.2.5 /v~∅/. In the stem-extensions of certain verbs /v/ alternates with zero, /v/ appearing in the infinitive-stem forms and zero in the present-stem forms.

dawać /da-v-a-ć/ 'to give' daje /da-je-∅/ 'he's giving'

malować /mal-ov-a-ć/ 'to paint' malujesz /mal-u-je-š/ 'you're painting'

zachowywać /za-xov-yv-a-ć/ 'to be keeping'
zachowujesz /za-xov-u-je-š/ 'you're keeping'

2.1.2.3 Miscellaneous consonant alternations.

2.1.2.3.1 /t~č/. This alternation occurs only in the verbs of the e/a class having base-final /t/, /t/ appearing in the infinitive-stem forms, and /č/ in the present-stem forms.

szeptać /šept-a-ć/ 'to whisper' szepcze /šepč-e-∅ 'he's whispering'

2.1.2.3.2 /t~ś/ and /d~ś/. This alternation occurs only in verbs of the e class with base-final /t/ or /d/. /t/ or /d/ are replaced by /ś/ in the infinitive.

wiodła /vjod-∅-w-a/ 'she was leading' wieść /vjeś-∅-ć 'to lead'

plotła /plot-Ø-w-a/ 'she was plaiting' pleść /pleś-Ø-ć/ 'to plait'

2.2 Vowel changes

2.2.1 Changes conditioned by phonemic environment.[8]

2.2.1.1 Change conditioned by preceding consonant.

2.2.1.1.1 /e~o/[1]. This alternation does not occur between the forms of a single paradigm, but only between forms constituting separate paradigms. The consonant preceding/e/ is stage II and that preceding /o/ is stage I.[9]

ciec /ćec/ 'to flow' potok /potok/ 'stream'
ciekło /ćekwo/ 'it flowed'
rzekła /žekwa/ 'she said' wyrok /vyrok/ 'sentence'
czerwieńszy /červjeńšy/ 'redder' czerwony /červony/ 'red'

2.2.1.2 Changes conditioned by following consonant.

2.2.1.2.1 /e~o/[2]. This alternation may occur between the forms of a single paradigm. The consonant preceding is always stage II. The consonant following /e/ is stage II and that following /o/ is stage I.[10]

imienia /imjeńa/ 'of a name' imiona /imjona/ 'names'
wypieczeni /vypječeni/ 'baked' (pl.) wypieczony /vypječony/ 'baked' (sg.)
cieśla /ćeśla/ 'chisel' ciosać /ćosać/ 'blow'

2.2.1.2.2 /e~a/. In this alternation, which may occur between the forms of a single paradigm, the vowel follows a stage II consonant or /j/. /a/ is followed by a stage I consonant, /e/ by stage II. The stage II consonant may either follow /e/ immediately or occur in a cluster following /e/.[11]

powiedzieć /povjeʒeć/ 'to tell (perfective)'
powiadywać /povjadyvać/ 'to tell (imperfective)'
jedzie /jeʒe/ 'he rides' jadę /jadeW̃/ 'I ride'
o jeździe /ojeźźe/ 'about a trip' jazda /jazda/ 'trip'
widzieli /viʒeli/ 'they saw' widziała /viʒawa/ 'she saw'
w lesie /vleše/ 'in a forest' las /las/ 'forest'
o wietrze /ovječše/ 'about wind' wiatr /vjatr/ 'wind'
śmieli /śmjeli/ 'daring (plural)' śmiały /śmjawy/ 'daring (singular)'
dziedzic /ʒeʒic/ 'heir, squire' dziadek /ʒadek/ 'grandfather'

2.2.1.2.3 Alternations of /e/ and /a/ before /r/. These alter-

nations occur only between forms constituting separate paradigms.[12]

2.2.1.2.3.1 /(e~a)r/[1]. In this alternation /a/ appears when the consonant following /r/ is stage I, /e/ when it is stage II. The consonant preceding the alternation is always stage II.

czernić /černić/ 'to blacken' czarny /čarny/ 'black

2.2.1.2.3.2 /(e~a)r/[2]. In this alternation, when /a/ appears, both the consonant preceding it and the consonant following /r/ are stage I. When /e/ appears, both the consonant preceding it and the consonant following /r/ are stage II.

śmierć /śmjerć/ 'death' martwy /martfy/ 'dead'
twierdzić /tfjerʒić/ 'to affirm' twardy /tfardy/ 'hard'

2.2.1.3 Changes conditioned by syllabic structure. These changes may occur between forms constituting a single paradigm.

2.2.1.3.1 /o~u/[1]. /o/ appears in open syllables, /u/ in closed syllables, when the alternation appears within a paradigm. When the alternation appears between forms constituting separate paradigms, both /o/ and /u/ may appear in either open or closed syllables. This alternation occurs principally in morphemes where the final consonant is voiced in some allomorph. It occurs only in a relatively small number of morphemes where the final consonant is always voiceless or is a nasal. When this alternation occurs, the traditional orthography uses the character o to write /u/.[13]

stół /stuw/ 'table' stołu /stowu/ 'of a table'
róg /ruk/ 'corner, horn' rogu /rogu / 'of a corner'
sól /sul/ 'salt' soli /soli/ 'of salt'
dróg /druk/ 'of roads' droga /droga/ 'road'
pól /pul/ 'of fields' pole /pole/ 'field'
półko /pulko/ 'little field'
robót /robut/ 'of works' robota /robota/ 'work'
robótka /robutka/ 'little job'
gotów /gotuf/ 'ready' gotowy /gotovy/ 'ready'
pomóc /pomuc/ 'to help' pomogę /pomogẽ̃w/ 'I'll help'
pomógł /pomuk/ 'he helped' pomogła /pomogwa/ 'she helped'
pomógłszy /pomukšy/ 'having helped'
pomóż /pomuš/ 'help!' pomoże /pomože/ 'he'll help'
pomóżcie /pomuśće/ 'help!'
zrób /zrup/ 'do...!' zrobić /zrobić/ 'to make, do'

zróbmy /zrubmy/ 'let's do..!'

2.2.1.3.2 /(e~o)$\tilde{w}$/[1]. In this alternation the vowel is followed by a nasal phoneme, namely /$\tilde{w}$/ or its replacements. That is, /$\tilde{w}$/ appears before all fricatives, except palatal fricatives, /j/ before palatal fricatives, /m/ before labial stops, /ń/ before palatal stops and affricates, and /n/ before dental, retracted, and velar stops and affricates. /$\tilde{w}$/ is lost in non-deliberate speech before /l/ and /w/. When this variation appears within a paradigm, /e/ occurs when the following /$\tilde{w}$/ or its replacement is followed by consonant plus vowel, while /o/ occurs if the /$\tilde{w}$/ is followed by word-boundary or by consonant plus consonant or word-boundary.[14]

zgiąć /zgjońć/ 'to bend' gięcie /gjeńće/ 'bending'
zgiąwszy /zgjo$\tilde{w}$fšy/ 'having bent' zgięty /zgjenty/ 'bent'
zgiął /zgjo$\tilde{w}$/ 'he bent' zgięła /zgje$\tilde{w}$wa/ 'she bent' (deliberate speech style)
rąk /ronk/ 'of hands' ręka /renka/ 'hand, arm'
rączka /rončka/ 'little hand'
jagniąt /jagńont/ 'of lambs' jagnięta /jagńenta/ 'lambs'
jagniątko /jagńontko/ 'little lamb'
ząb /zomp/ 'tooth' zęba /zemba/ 'of a tooth'
święto /šfjento/ 'holiday' świąt /šfjont/ 'of holidays'
mąż /mo$\tilde{w}$š/ 'husband' męża /me$\tilde{w}$ža/ 'of a husband'
świąt /šfjont/ 'of holidays' święto /šfjento/ 'holiday'

2.2.1.4 Change conditioned by vowel in following syllable.

2.2.1.4.1 /(e~o)$\tilde{w}$/[2]. In this alternation /e/ occurs when there is /i/ or /y/ in the following syllable. /o/ occurs otherwise.

pieniądze /pjeńonže/ 'money' pieniędzy /pjeńenzy/ 'of money' pieniędzmi /pjeńenzmi/ with money'
miesiąc /mješonc/ 'month' miesięcy /mješency/ 'months'

2.2.1.5 Alternation of vowels with zero. All these alternations may occur between forms constituting a single paradigm.

2.2.1.5.1 /e~Ø/[1]. Movable /e/ without substitutive softening.

Morphemes frequently occur having one allomorph consisting of or terminating in a consonant cluster, which allomorph appears before vowels, and another allomorph containing /e/ before the final consonant, which latter allomorph appears before a consonant or before word-boundary. In addi-

tion, certain suffixes have one allomorph consisting of one or more consonants, which appears when the suffix is followed by a vowel and another allomorph consisting of an /e/ followed by these consonants when the suffix is followed by word-boundary or by a consonant. Further, all prefixes and prepositions which have an allomorph terminating in a consonant (prefixes and prepositions with but one allomorph all terminate in vowels) also have an allomorph with an added /e/. In the case of prefixes, the allomorph terminating in /e/ is used before bases beginning with consonant clusters. In the case of prepositions, the allomorph with /e/ is used before bases beginning with a limited number of clusters, which must be listed separately for each preposition. I refer to this /e/ which alternates with zero as 'movable e'. Its occurrence frequently prevents the formation of consonant clusters incompatable with the Polish phonological system.[15]

As /k/ and /g/ do not appear in standard Polish before /e/ except in recent borrowings, /k/ and /g/ are replaced by /kj/ and /gj/ respectively before 'movable e'. Examples:

dziadka /ʒatka/ 'of grandfather' dziadek /ʒadek/ 'grandfather'
córka /curka/ 'daughter' curek /curek/ 'of daughters'
bocca /bocca/ 'of a push' bodziec /boʒec/ 'push'
ciotka /ćotka/ 'aunt' ciotek /ćotek/ 'of aunts'
cioteczna /ćotečna/ 'pertaining to one's aunt'
kufra /kufra/ 'of a trunk' kufer /kufer/ 'trunk'
łba /wba/ 'of a head' łeb /wep/ 'head (of an animal)'
pełny /pewny/ 'full' pełen /pewen/ 'full'
jedno /jedno/ 'one' jeden /jeden/ 'one'
rozdarł /rozdar/ 'he tore up' rozedrze /rozedže/ 'he'll tear up'
w Anglii /vanglji/ 'in England' we Francii /vefrancji/ 'in France'
okno /okno/ 'window' okien /okjen/ 'of windows'
ognia /ogńa/ 'of fire' ogień /ogjeń/ 'fire'

This alternation also occurs not conditioned by the above-stated phonological factors when /e/ occurs as a base-extension in the present-stem forms of certain verbs: dolać /do-l-a-ć/ 'to add by pouring' dolejesz /do-le-je-š/ 'you'll add by pouring'.

2.2.1.5.2 /e~∅/[2]. Movable /e/ with substitutive softening.

In the examples given above there was no change in the consonants preceding movable /e/, except those occasioned by general morphophonemic principles. In many cases where movable /e/ occurs (never however in a prefix or preposition) it may be accompanied by substitutive softening, the consonant preceding /e/ being stage II when /e/ is present and stage I when it is not.

dnia /dńa/ 'of a day' dzień /ʒeń/ 'day'
chłopca /xwopca/ 'of a boy' chłopiec /xwopjec/ 'boy'
wsi /vśi/ 'of a village' wieś /vjeś/ 'village'
dworcu /dvorcu/ 'of a station' dworzec /dvožec/ 'railroad station'
ojca /ojca/ 'of father' ojciec /ojćec/ 'father'

This alternation may also occur in verb roots, in which case occurrence of /e/ is not conditioned by the position of the morpheme before consonant or word-boundary. Rather, it occurs interparadigmatically or between present and infinitive stems. Thus:

słać /swać/ pościelać /pośćelać/ 'to strew' (root: /sw~śćel/)
rzezać /žezać/ 'to butcher, circumcise' rznąć /rznońć/ 'to cut'

2.2.1.5.3 /o~∅/[1]. Movable /o/ with substitutive softening. Movable /o/ occurs in the same phonemic environments as movable /e/, but does not occur in prefixes, suffixes, or prepositions. It occurs much more rarely than movable /e/. The consonant before /o/ is always stage II, being stage I when /o/ is absent.

kotła /kotwa/ 'of a kettle' kocioł /koćow/ 'kettle'
kozła /kozwa/ 'of a goat' kozioł /kožow/ 'goat'

2.2.1.5.4 /a~∅/. This alternation takes place before /r/ or its stage II alternate /ř/. /a/ appears when the /r/ is followed by a consonant or is word-final. Zero appears when the /r/ is followed by a vowel. The alternation occurs mainly in verbs of the e class with base-final /r/.

dr̂e /drew̆/ 'I'm tearing' darł /dar/ 'he was tearing'
drze /dže/ 'he's tearing' darła /darwa/ 'she was tearing'
drzeć /dżeć/ 'to tear' darty /darty/ 'torn'

marznąć /marznoń-ć/ 'to freeze' mróz /mrus/ 'frost'
mrozu /mrozu/ 'of frost'

In the root /marz- mroz- mruz-/ there is a parallel alternation /o~∅/[2], which latter is combined with /o~u/[1].

2.2.2 Vowel changes not conditioned by phonemic environment.

2.2.2.1 Alternations of /i/ and /y/ with zero. These alternations appear in verb roots, /i/ or /y/ appearing when the root is actualized as the base of an iterative or prefixed imperfective verb and being absent when the root is actualized as the base of an unprefixed imperfective or prefixed perfective verb.

2.2.2.1.1 /i~∅/.

zapominać /za-po-min-a-ć/ zapomnieć /za-po-mń-e-ć/ 'to forget'

2.2.2.1.2 /y~∅/.

połykać /po-wyk-a-c/ połknąć /po-wk-noń-∅-ć/ 'to swallow'

2.2.2.2 /o~∅/[2]. /o/ appears as a base-extension in the present-stem forms of the verbs stać 'to stand' and bać się 'to fear'.

stac /st-a-ć/ 'to stand' stojisz /sto-ji-š/ 'you're standing'

2.2.2.3 Alternations of /u/ with /o/ and /y/.

These alternations occur mainly in the verbal stem-suffixes u/ov and u/yv, where they are conditioned by the alternation /v~∅/ (see above 2.1.2.2.5), /o/ and /y/ appearing with /v/ and /u/ with zero.

2.2.2.3.1 /o~u/[2].

malować /mal-ov-a-ć/ 'to paint' malujesz /mal-u-je-š/ 'you're painting'

2.2.2.3.2 /o~y/.

zachowywać /za-xov-yv-a-ć/ 'to be keeping'
zachowujesz /za-xov-u-je-š/ 'you're keeping'

2.2.2.4 /o~a/. This alternation appears between the bases of perfective verbs and their imperfective counterparts, /o/ appearing in perfective, /a/ in imperfective verbs.

zwolnić /zvoln-i-ć/ zwalniać /zvaln-a-ć/ 'to free'

2.2.5 Combinations of special vowel changes.

Below, we list combinations of special vowel changes which occur in Polish. It is not an exhaustive list of all occurring combinations, but it lists the most common ones.

2.2.5.1 /e~(o~u)/[1]. /e~o/[1] is the principal alternation with

/o~u/[1] subordinate on the /o/ side.

leżeć /leżeć/ 'to be lying' łoże /woże/ 'bed'
lec /lec/ 'to lie down' łóżko /wuśko/ 'bed'
legło /legwo/ 'it lay down'

2.2.5.2 /e~(o~u)/[2] /e~o/[2] is the principal alternation with /o~u/[1] subordinate.

ziele /źele/ 'greens' zioło /źowo/ 'herb'
ziół /źuw/ 'of herbs'
weseli /veseli/, wesoły /vesowy/, wesół /vesuw/ 'gay, happy'
w kościele /fkośćele/ 'in church' kościoła /kośćowa/ 'of church' kościół /kośćuw/ 'church'
brzezina /bžezina/ 'birch grove' brzoza /bžoza/ 'birch'
brzóz /bžus/ 'of birches'
sielski /śelski/ 'pertaining to a hamlet' sioło /śowo/ 'hamlet'
siół /śuw/ 'of hamlets'

2.2.5.3 /((e~o)~(o~u))~∅/. This alternation represents a combination of /e~∅/[1] as principal alternation and /e~o/[1] subordinate to it. Subordinate to the latter are /e~o/[2] and /o~u/[1]. We may take as an example the verb root /br~bjer~bjor~bjur~bor~bur/ in the following verb forms: brać /brać/ 'to take', bierze /bježe/ 'he's taking', rozbierać /rozbjerać/ 'to disassemble', biorę /bjorew̃/ 'I'm taking', rozbiór /rozbjur/ 'partition (of Poland)', wybór /vybur/ 'selection', wyboru /vyboru/ 'of a selection'.

2.2.5.4 /(e~(o~u))~o/. This alternation represents a combination of /e~o/[1] and /e~o/[2], /e~o)[2] also being combined with /o~u/[1]. Example: The verb root /ńes~ńos~ńus~nos/ in nieść /ńeść/ 'to carry', niesli /ńeśli/ 'they carried', niesie /ńeśe/ 'he's carrying', niosę /ńosew̃/ 'I'm carrying', niosła /ńoswa/ 'she carried', niósł /ńus/ 'he carried', nosić /nosić/ 'to carry (repetitive)'.

2.2.5.5 /(e~(o~u))~(o~u)/. This alternation represents a combination of /e~o/[1] and /e~o/[2] each combined with /o~u/[1]. Examples: The verb root /vjez~vjoz~vjuz~voz~vuz/ in wieźć /vješć/ 'to haul, convey, carry by vehicle', wiezie /vješe/ 'he's hauling', wiozę /vjozew̃/ 'I'm hauling', wiozła /vjozwa/ 'she hauled', wozić /vožić/ 'to haul (repetitive), wozu /vozu/ 'of a wagon or vehicle', wóz /vus/ 'wagon, vehicle'.

2.2.5.6 /(e~(o~u))~a/. This alternation represents a combination of /e~o/[2], /o~u/[1], and /e~a/. Examples: The root /gńet~gńot~gńut~gńat/ in the verb wygnieść /vygńeść/ 'to press out' wygniecie /vygńećе/ 'he'll press out', wygniotę /vygńoteW/ 'I'll press out', wygniotło /vygńotwo/ 'it pressed out', wygniotł /vygńut/ 'he pressed out', wygniatać /vygńatać/ 'to press out (imperfective)'.

2.2.5.7 /(o~u)~a/. This alternation represents a combination of /o~u/[1] and /o~a/. Examples: The root /mog~mug~mag/ in pomogę /pomogeW/ 'I'll help', pomoże /pomoże/ 'he'll help, pomogła /pomogwa/ 'she helped', pomógł /pomuk/ 'he helped', pomóc /pomuc/ 'to help (perfective)', pomagać /pomagać/ 'to help (imperfective)'. The root /mov~muv~mav/ in mowa /mova/ 'speech', mówić /muvić/ 'to speak', mawiać /mavjać/ 'to speak (repetitive)'.

2.2.5.8 /u~(y~(e~∅)/. This alternation represents a combination of the alternations /u~y/, /y~∅/, and /e~∅/[1]. Example: The root /tx~dex~dyx~dux/ in the words tchu /txu/ 'of breath', dech /dex/ 'breath', zdechnąć /zdexnońć/ and zdychać zdyxać/ 'to breathe', duch /dux/ 'spirit', dusza /duša/ 'soul'.

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1. My informants were Mrs. Hania Prentiss (Cracow), Adam Woyna and Henry de Uznański (both of Zakopane). I was also assisted by valuable hints and comments from my friend and colleague Casimir Borkowski, a native speaker from Warsaw.
2. In preparation of this paper I had occasion to consult the following works:

Arend-Choiński, Z.V., A Polish phonetic reader, London: University of London Press, 1924.

Doroszewski, Witold, Podstawy gramatyki polskiej, Warsaw: Państwowe wydawnictwo naukowe, 1952.

Grappin, Henri, Grammaire de la langue polonaise, Paris: Droz, 1942.

Krol, Kasimir, Brieflicher Sprach- und Sprechunterricht für das Selbststudium der polnischen Sprache, Berlin: Langenscheidt (no date).

Schenker, Alexander M., "Polish conjugation" in Slavic Word 3, pp. 469 - 481.

Scherer, Phillip, "Juncture in Polish" in Language 22, pp. 553 - 555.

Słoński, Stanisław, Historia języka polskiego w zarysie Warsaw: Państwowe wydawnictwo naukowe, 1953.
Sörensen, Asmus, Polnische Grammatik in systematischer Darstellung, Berlin: Haberland, 1900.
Stankiewicz, Edward, "The distribution of morphemic variants in the declension of Polish substantives" in Slavic Word 4, pp. 554 - 574.
Szober, Stanisław, Gramatyka języka polskiego, Warsaw: Nasza księgarnia, 1953.
Trager, George L., "La systématique des phonèmes en polonais" in Acta Linguistica 1, pp. 179 - 188.

3. A word is defined as a syntactic element consisting of one or more morphemes, which may occur freely in the environment of syntactic elements of various kinds, but none of whose constituents may occur except in conjunction with other elements of the same morphological category as those with which it occurs within the word. (This definition is understood to apply only to the word in Polish). Thus, in the word żona /žon-a/ 'wife' the ending /a/ does not occur except in conjunction with noun (and adjective) stems, as in kobieta /kobjet-a/ 'woman', rączka /ronč-k-a/ 'little hand', etc., while the base /žon-/ occurs only in conjunction with suffixes and inflectional elements as in /žon-y/ 'of a wife', /žoń-e/ 'to a wife', /žon-Ø/ 'of wives', /žeń-sk-i/ 'feminine', etc. Enclitics such as /mi/ 'to me', /(e)m/ 'am', proclitics such as /v(e)/ 'in' are words, since they occur freely in the utterance with elements of various syntactic classes. Thus, /(e)m/ occurs in such diverse environments as kochałem /kox-a-w-Ø-em/ 'I loved' (man speaking)', kochałam /kox-a-w-a-m/ 'I loved (woman speaking)', ciekawym /ćekav-y-m/ 'I'm interested (man speaking)', abym /a-by-m/ 'so that I would....'.

Words may in turn be divided into clitics (en- and proclitics) and non-clitics (independent words). The vast majority of Polish words are non-clitic. Non-clitics have lexical stress, usually on the penultimate syllable. They can occur as minimal free utterances and when occurring within an utterance are marked by the possibility of occurrence of some form of transition other than close transition at their boundaries. Clitic elements have no stress of their own, but form one stress unit with the word they precede or follow.

Some words, such as nie /ńe/ 'no!, not' function sometimes as non-clitics (Nie! /³ńe¹ / 'No.'), sometimes as clitics (nie robimy /²ńerobimy¹ / 'we're not working'). Compound words are clusters of two or more words functioning morphologically (not just syntactically) as one word, i.e. having one set of inflexional elements serving both stems. Compound words may have more than one lexical stress and may have open transition within their bounds.

4. What I term general morphophonemic change has been called regular phonology, automatic morphophonemics (see Z.S. Harris, Methods in structural linguistics, footnote 8 to 14.23 on p. 223), or phonologically conditioned alternation (see Herbert Rubenstein, A comparative study of morpho-phonemic alternations in standard Serbo-Croatian, Czech and Russian, Ann Arbor, 1950, p. 7). What I term special morphophonemic change is roughly equivalent to Rubenstein's morphologically conditioned alternation. I am indebted to Carleton T. Hodge for the suggestion of the terms "general" and "special" in this context.
5. Prefixation is the occurrence of any of a limited number of morphemes (less than twenty) before the word-base. More than one prefix may occur in a word. It is difficult to define the morphological-syntactic status of prefixes. Most of them occur as separate words (usually prepositions) also. It is symptomatic that open transition may occur between a prefix and a base. Compare the prefixed verb wjeździc /wjeźźić/ 'to drive in' with the unprefixed word więzień /vjeźeń/ 'prisoner'. I am inclined to regard words containing prefixes as a sub-category of compound words.
6. In this paper, when I refer to verb types and the breakdown of the verb into various kinds of constituents such as prefix, base, stem-suffix, thematic vowel, formant, and ending, the classification and division is according to a comprehensive study of the Polish verb morphology now nearing completion, which I expect to publish shortly.
7. The term substitutive softening is, of course, not original with me, but has been used by Slavicists previously.
8. It must be understood that the special sound changes listed below as being determined or partially determined by phonemic environment do not always occur when the requisite environment is present, (if they did, they would be, of course,

general rather than special sound changes). Very frequently, a whole paradigm will show but one allomorph of a given morpheme, while other paradigms containing the same morpheme may show another allomorph or both the first allomorph and another allomorph or allomorphs. However, when such a special morphophonemic change occurs between forms of a single paradigm, the alternant chosen is determined by the phonemic environment. When a single paradigm shows but one alternant, the alternant occurring in the paradigm is usually that required by the phonemic environment of the majority of the forms or of the statistically most frequent forms. Historically, this situation is the result of analogical levelling within the paradigm (Paradigmenzwang). Thus, the adjective biały /bjaw-y/ 'white' retains the vowel /a/ before the base final /l/ of the nominative plural masculine personal form biali /bjal-i/, though /e/ would be expected here (see point 2.2.1.2.2). The comparative forms bielszy /bjelšy/ etc. show the /e/ conditioned by the phonemic environment.

9. Those concerned with the historical development of Slavic will, of course, recognize this alternation as the reflex of Indo-European ablaut variation between e and o grades, the substitutive softening resulting from the originally allophonic palatalization in proto-Slavic.
10. Slavicists will, of course, recognize this as a result of the Polish development whereby common Slavic /e/ before certain unpalatalized consonants resulted in Polish /o/ while giving Polish /e/ in other positions.
11. This is the result of the Polish development whereby common Slavic /e/ before certain unpalatalized consonants resulted in /a/ and before palatalized consonants in /e/, a development paralleling that described in footnote 10.
12. The alternation takes place only when /r/ is followed by the consonants /t d s z n/.
13. This results from the fact that early Polish long /o/ of no matter what origin fell together with /u/. In Old Polish /o/ was regularly lengthened in closed syllables before certain voiced consonants.
14. This, of course, is the result of the change whereby a quantitative change in the Old Polish nasal vowel resulted in two qualitatively different nasal diphthongs /e$\tilde{w}$/ and /o$\tilde{w}$/, the former resulting from the short nasal and the latter from the long nas-

al. The nasal vowel underwent lengthening in closed syllables under conditions similar to those under which /o/ was lengthened in Old Polish.

15. Stankiewicz (footnote 2 above) states that movable /e/ only occurs before the consonants /m v n ń r l w k g c ć/ in bases containing a vowel other than the movable /e/.

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